

SECTION II—CLAIMS

1. (Currently Amended) An apparatus comprising:
 - a die mounted on a substrate, the die being connected to the substrate by a plurality of wires; and
 - a mold cap encapsulating the die and the plurality of wires, the mold cap comprising an electrically insulating portion encapsulating the wires and at least a ~~portion~~ part of the die, and a thermally conductive portion ~~overmolded on the die and encapsulating substantially all~~ the electrically insulating portion and any part of the die not encapsulated by the electrically insulating portion.
2. (Original) The apparatus of claim 1 wherein the die comprises an integrated circuit.
3. (Original) The apparatus of claim 1 wherein the electrically insulating material comprises a curable resin, a crosslinker, a catalyst, and a reinforcing filler.
4. (Original) The apparatus of claim 3 wherein the reinforcing filler comprises silica, alumina, zinc oxide, talc, or combinations thereof.
5. (Original) The apparatus of claim 1 wherein the thermally conductive material comprises a curable resin, a crosslinker, a catalyst, and a metal filler.
6. (Original) The apparatus of claim 5 wherein the metal filler comprises aluminum, silver, copper, gold, or combinations or alloys thereof.
7. (Original) The apparatus of claim 1 wherein the electrically insulating portion encapsulates the wires and the entire die.
8. (Original) The apparatus of claim 1 wherein the electrically insulating portion encapsulates the wires and a perimeter of the die.
9. (Original) The apparatus of claim 1, further comprising a heat dissipation device attached to, and in thermal contact with, the thermally conductive material.
10. (Currently Amended) An apparatus comprising:
 - a stack of dies mounted on a substrate, the stack including a first die attached to the substrate and at least one additional die stacked thereon;

a plurality of wires connecting at least one of the stacked dies to the substrate or to another die in the stack; and

a mold cap encapsulating the wires and the plurality of stacked dies, the mold cap comprising an electrically insulating portion encapsulating the wires and at least a ~~portion~~ part of the stacked dies, and a thermally conductive portion ~~overmolded on the stack of dies and~~ encapsulating substantially all the electrically insulating portion and any part of the stacked dies not encapsulated by the electrically insulating portion.

11. (Original) The apparatus of claim 10 wherein at least one of the stacked dies comprises an integrated circuit.
12. (Original) The apparatus of claim 10 wherein the first die is flip-chip bonded to the substrate.
13. (Original) The apparatus of claim 10 wherein the electrically insulating material comprises a curable resin, a crosslinker, a catalyst, and a reinforcing filler.
14. (Original) The apparatus of claim 10 wherein the reinforcing filler comprises silica, alumina, zinc oxide, talc, or combinations thereof.
15. (Original) The apparatus of claim 10 wherein the resin comprises a curable resin, a crosslinker, a catalyst, and a metal filler.
16. (Original) The apparatus of claim 15 wherein the metal filler comprises aluminum, silver, copper, gold, or combinations or alloys thereof.
17. (Original) The apparatus of claim 10 wherein the electrically insulating portion encapsulates the wires and the entire stack of dies.
18. (Original) The apparatus of claim 10 wherein the electrically insulating portion encapsulates the wires and the perimeter of the dies in the stack of dies.
19. (Original) The apparatus of claim 10, further comprising a heat dissipation device attached to, and in thermal contact with, the thermally conductive material.
- 20.-37. (Withdrawn)
38. (New) An apparatus comprising:

a die mounted on a substrate, the die being connected to the substrate by a plurality of wires; and

a mold cap encapsulating the die and the plurality of wires, the mold cap comprising:

an electrically insulating portion encapsulating substantially only the wires, and

a thermally conductive portion encapsulating the die and the electrically insulating portion that encapsulates the wires.

39. (New) The apparatus of claim 38 wherein the electrically insulating material comprises a curable resin, a crosslinker, a catalyst, and a reinforcing filler.
40. (New) The apparatus of claim 39 wherein the reinforcing filler comprises silica, alumina, zinc oxide, talc, or combinations thereof.
41. (New) The apparatus of claim 38 wherein the thermally conductive material comprises a curable resin, a crosslinker, a catalyst, and a metal filler.
42. (New) The apparatus of claim 41 wherein the metal filler comprises aluminum, silver, copper, gold, or combinations or alloys thereof.
43. (New) The apparatus of claim 38, further comprising a heat dissipation device attached to, and in thermal contact with, the thermally conductive material.
44. (New) An apparatus comprising:

a stack of dies mounted on a substrate, the stack including a first die attached to the substrate and at least one additional die stacked thereon;

a plurality of wires connecting at least one of the stacked dies to the substrate or to another die in the stack; and

a mold cap encapsulating the wires and the plurality of stacked dies, the mold cap comprising:

an electrically insulating portion encapsulating substantially only the wires, and

a thermally conductive portion encapsulating the plurality of stacked dies and the electrically insulating portion that encapsulates the wires.

45. (New) The apparatus of claim 44 wherein at least one of the stacked dies comprises an integrated circuit.
46. (New) The apparatus of claim 44 wherein the first die is flip-chip bonded to the substrate.
47. (New) The apparatus of claim 44 wherein the electrically insulating material comprises a curable resin, a crosslinker, a catalyst, and a reinforcing filler.
48. (New) The apparatus of claim 44 wherein the reinforcing filler comprises silica, alumina, zinc oxide, talc, or combinations thereof.
49. (New) The apparatus of claim 44 wherein the resin comprises a curable resin, a crosslinker, a catalyst, and a metal filler.
50. (New) The apparatus of claim 49 wherein the metal filler comprises aluminum, silver, copper, gold, or combinations or alloys thereof.
51. (New) The apparatus of claim 44, further comprising a heat dissipation device attached to, and in thermal contact with, the thermally conductive material.